

# BEST AVAILABLE COPY

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
10 March 2005 (10.03.2005)

PCT

(10) International Publication Number  
**WO 2005/021921 A3**

- (51) International Patent Classification<sup>7</sup>: **E21B 29/00**,  
17/042
- (21) International Application Number:  
PCT/US2004/028423
- (22) International Filing Date:  
1 September 2004 (01.09.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/499,576 2 September 2003 (02.09.2003) US
- (71) Applicant (for all designated States except US): **ENVEN-  
TURE GLOBAL TECHNOLOGY [US/US]**; 16200 A  
Park Row, Houston, TX 77084 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **COSTA, Scott**  
[US/US]; 25614 Broadcast Court, Katy, TX 77494 (US).
- (74) Agents: **HAYNES AND BOONE LLP** et al.; 901 Main  
Street, Suite 3100, Haynes and Boone, LLP, Dallas, Texas  
75202 (US).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,  
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

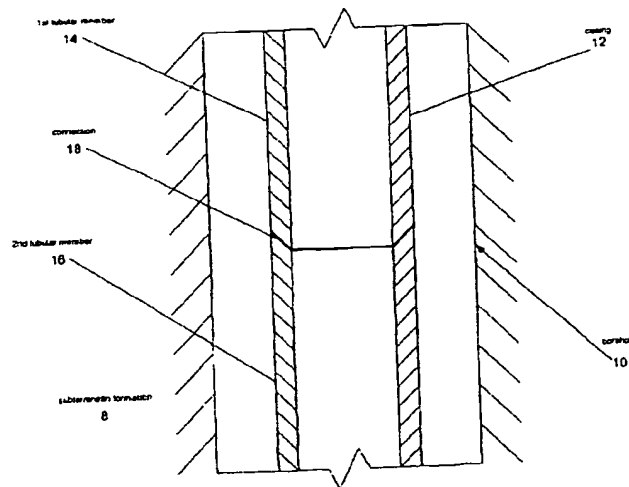
— of inventorship (Rule 4.17(iv)) for US only

Published:

— with international search report

[Continued on next page]

(54) Title: A METHOD OF RADially EXPANDING AND PLASTICALLY DEFORMING TUBULAR MEMBERS



(57) Abstract: A method of radially expanding and plastically deforming a tubular assembly comprising a first tubular member, a second tubular member, and a mechanical coupling for coupling the first tubular member to the second tubular member, the method comprising placing the mechanical coupling in tension; and then radially expanding and plastically deforming the mechanical coupling. It is emphasized that this abstract is provided to comply with the rules requiring an abstract to allow a searcher or other reader to quickly ascertain the subject matter of the technical disclosure; and is submitted with the understanding that it will not be used to limit the scope or meaning of the claims under 37 CFR 1.72.

WO 2005/021921 A3

BEST AVAILABLE COPY

WO 2005/021921 A3



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(88) Date of publication of the international search report:  
25 August 2005

# BEST AVAILABLE COPY

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/28423

### A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : E21B 29/00, 17/042

US CL : 166/277,382,207,208

According to International Patent Classification (IPC) or to both national classification and IPC

### B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
U.S. : 166/277,382,207,208,297,55,55.1,206,212,216,214,242.1,242.2

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
Please See Continuation Sheet

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X — Y	US 6,607,220 B2 (Sivley, IV) 19 August 2003 (19.08.2003), Figures.	1,4,6,13,17,18,20,21,25 28,30,33- 38,41,44,45,53,57,58,6 0,61,65-70,73,76,77 ----- 2,3,5,7-12,14-16,19,22- 24,26,27,29,31,32,39,4 0,42,43,45,47-52,54- 56,59,62- 64,71,72,74,75
Y	US 6,543,552 B1 (Metcalf et al.) 08 April 2003 (08.04.2001), Figures.	2,3,5,7-12,14-16,19,22- 24,26,27,29,31,32,39,4 0,42,43,45,47-52,54- 56,59,62- 64,71,72,74,75

☒ Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z"

document member of the same patent family

Date of the actual completion of the international search

21 April 2005 (21.04.2005)

Date of mailing of the international search report

13 JUL 2005

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US

Commissioner for Patents

P.O. Box 1450

Alexandria, Virginia 22313-1450

Facsimile No. (703) 305-3230

Authorized officer

David Bagnell

Telephone No. 571-272-3600

BEST AVAILABLE COPY

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US04/28423

C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	US 2004/0231839 A1 (Ellington et al.) 25 November 2004 (25.11.2004), Figures.	1-77
A,P	US 2004/0060706 A1 (Stephenson) 01 April 2004 (01.04.2004), Figures.	1-77
A	US 2003/0075338 A1 (Sively, IV) 24 April 2003 (24.04.2003), Figures.	1-77
A	US 6,419,025 B1 (Lohbeck et al.) 16 July 2002 (16.07.2002), Figures.	1-77
A,P	US 2004/0221996 A1 (Burge) 11 November 2004 (11.11.2004), Figures.	1-77
A	US 2003/0042022 A1 (Lauritzen et al.) 06 March 2003 (06.03.2003), Figures.	1-77
A	US 6,527,049 B2 (Metcalf et al.) 04 March 2003 (04.03.2003), Figures.	1-77
A,P	US 6,722,443 B1 (Metcalf) 20 April 2004 (20.04.2004), Figures.	1-77